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ABSTRACT

Based on experience gained in a project in Vermont that is demonstrating potential applications of telephone conferencing to services for the developmentally disabled, this paper summarizes the most important factors in establishing a telephone conferencing system. Basic terminology is described and factors to be considered in selecting telephone instruments are discussed. Some simple guidelines are provided on how to deal effectively with telehone companies and some general statements are made about costs of various services. The importance of good training for users is also discussed. The appendices include descriptions of eight kinds of end instruments that were tested for the Vermont project and a list of eight publications on telecommunications and service to the developmentally disabled. (CHC)

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ESTABLISHING A TELEPHONE CONFERENCING SYSTEM: THE DYNAMICS OF DOING IT

by
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BACKGROUND

In September 1978, the Alternate Media Center, School of the Arts, New York University, received a two-year grant from the Department of Health and Human Services, formerly Health, Education and Welfare, to explore and demonstrate potential applications of telecommunications in the field of developmental disabilities. This work is being conducted in collaboration with the American Association of University Affiliated Programs, the Department of Pediatric Service at The Roosevelt Hospital in New York City, and the Institute for the Future in Menlo Park.

After an extensive needs assessment, the project team in conjunction with its advisory board decided on a three-pronged approach to demonstrations:

1. In collaboration with the UAF satellite in Burlington, Vermont, and with other Vermont DD organizations, implement a coordinated program of telecommunications applications focusing within that state.
2. Explore the use of telecommunications for national "networking" among UAPs and related centers.
3. Provide technical assistance to a limited number of projects that attempt to make innovative use of telecommunications in the DD field.

Papers describing various aspects of the "Telecommunications and Service to the Developmentally Disabled" project are listed in the Appendix and are available upon request.

ESTABLISHING A TELEPHONE CONFERENCING SYSTEM: THE DYNAMICS OF DOING IT

ABSTRACT

Consumer organizations considering the use of telephone conferencing systems often do not know what types of problems are likely to arise in implementing such systems. Based on experience gained in a project that is demonstrating potential applications of telephone conferencing, this paper summarizes the most important factors in establishing a telephone conferencing system.

INTRODUCTION

Telephone conferencing systems offer new communications capabilities to a wide variety of consumer organizations. Yet these groups often have no realistic sense of how to actually implement such a system. While the potential of telephone conferencing has been well articulated, the practical aspects of realizing that potential are often poorly understood.

This paper will briefly summarize the most important factors in establishing a telephone conferencing system. These factors are based on experience gained in a project that is demonstrating potential applications of telephone conferencing for organizations in Vermont which serve people with developmental disabilities (DD).* The fact that the situation in Vermont presents many technical challenges (e.g., the state has eight different telephone companies that provide varying levels of service) makes the project a good vehicle for illustrating the variety of difficulties that might confront prospective users.

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*A developmental disability is defined as a severe, chronic disability attributable to a mental and/or physical impairment, manifested before the person reaches age 22 and likely to continue indefinitely.

Asking some basic questions will help potential users of telephone conferencing systems decide exactly what is necessary to meet their particular needs. These questions are:

Who wants to talk to whom?

At what locations?

During what time of day?

For how long?

With what frequency?

Using what telephone system?

With what kinds of telephone instruments?

To begin answering these questions, some basic definitions are required. Telephone (or audio) conferencing is the ability to join three or more people through telephone lines. Bridging is the technology that enables multiple lines to be connected, creating the telephone conference.

Port is a term used to describe the line capacity of a bridge. A nine-port bridge means that up to nine telephone lines can be dialed and nine points can talk to each other. Some ports can be hooked up to direct distance dialing (DDD) lines, others to wide area transmission service lines (WATS), and still others to foreign exchange line (FX) services. Any voice-grade line service can be connected by the bridge in any combination. The choice of line services depends on the universe of users and the administrative organization of the conference service.

The systems themselves must also be defined. In "meet me" conferencing services, each participant calls in to a central number at an appointed time to initiate a conference. In operator-assisted conferencing services, each participant is called by an operator at an appointed time.

Let's examine some different types of administrative organizations and bridges. A "meet me" bridge could be designed to be a pay-as-you-go service with a flat fee for overhead. The appropriate line services would be DDD so that each group would pay according to usage. A "dial out" bridge could be designed to handle urgent problem-solving tasks. A group that wanted access to a variety of different people would choose a series of WATS-out line services.

For Vermont, a "meet me" bridging service was designed to be both cost effective and available to a wide range of users, each with different abilities to pay. The line configuration is a combination of WATS-in, DDD, and foreign exchange. (For FX, the caller dials a local number and the purchaser pays the cost of transmission to the exchange where the bridge is located.) With that setup, users only incur the cost of a local phone call, while the management of the bridge recoups costs through service charges to various users based on ability to pay.

The users of a bridge service will change. These changes should be monitored in order to insure that the line services used continue to be appropriate.

TELEPHONE INSTRUMENT SELECTION

Based on the experience with the DD project in Vermont, the telephone instrument configuration of choice is for everyone on a telephone conference to use their own telephone handsets.* The next preference is to use a speakerphone at those sites where two or more people need to be involved and where the telephone line capacity is restricted (i.e., an office with no more than two phone lines).

The clarity of sound on a telephone conference is compromised each time a speakerphone is used. The amount of degradation experienced is directly proportional to the number of speakerphones involved and the audio environment of each speakerphone location. If the speakerphones are located in rooms with hard walls, glass windows, and similar surfaces, the sound from that location will tend to be echo-like. If two or more points have such an environment, the sound problems are compounded.

When two or more speakerphones are used, they should be the same kind if at all possible. Different manufacturers use different designs for internal audio switching. These different switching systems will probably not complement each other, resulting in "clipping." (See Appendix A for a detailed assessment of the eight types of end instruments tested in the Vermont project.)

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*An obvious consideration in selecting telephone instruments is any special need of the users (e.g., users confined to wheelchairs and the hearing impaired). While special equipment for such users is not always available, there is a growing interest in these devices.

COMMUNICATING WITH THE PHONE COMPANY

Some simple guidelines can help users deal effectively with telephone companies. For example, if you have a question about specialized services such as bridges, go directly to an account manager. The people who answer the phones at the business office are given productivity ratings based on how many clients they handle per day. Questions requiring extensive research adversely affect those ratings. Therefore, if you call the business office with a question about bridges, the employee who answers is likely to listen politely, take down your questions, but probably not call you back or simply say that such a service does not exist.

You will also probably face resistance from people at the phone company when you first mention new services like telephone conferencing. Educating them about your needs and securing their cooperation takes time. This should be kept in mind when trying to determine time lines.

Be aware that the phone company has a highly evolved organizational structure. Great attention is paid to using the proper channels, and there is dogged resistance to leapfrogging levels of responsibility for the sake of expediency. However, as in every organization, some people are more skilled at getting things done than others. An important goal is to determine who those people are and contact them for help and advice. Talk to people who have worked closely with the phone company in the past; they can provide insights into company operations and personnel. However, it is generally a good idea to keep your account manager informed about who you contact within the company since anyone you talk to will only work through an account manager.

Also bear in mind that the phone company has a highly specialized language. Although it is mystifying at first, company people are usually willing to explain any mysterious terms. If a term is unfamiliar to you, ask for an explanation; do not make unfounded assumptions. Soon new terms will become familiar to you.

Be thoughtful about exerting pressure on the phone company through a regulatory body such as a public utilities commission unless you are both desperate and fairly certain of your legal rights. The phone company is well insulated by protective legislation. A crack in that protection, the Carter Phone Decision, which enables anyone to attach his own instruments to phone wires, is just that--a crack. If the phone company chooses

to be uncooperative, it can be sticky about such things as Federal Communications Commission registration numbers, the technical integrity of new technologies, the acceptability of circuit design, and many other matters. Confrontation should be a last resort when no other choices seem left. Such tactics create ill will for everyone and are usually counterproductive. Although the amount of time required to develop good working relationships is considerable, the result is a productive group effort aimed at making a new telephonic technology work.

COST

Some general statements can be made about costs of the various services. Commercial "meet me" conferencing services such as the Kellogg Telecommunications Corporation in Littleton, Colorado, and Darome Inc. in Danbury, Connecticut, are configured so that each participant pays his own line charge. In addition, there is a per-minute charge for using their bridge.

Commercial operator-assisted conferencing is available through Bell Telephone. One number is billed for the conference. The cost is computed by taking the longest link in the conference and multiplying it by the total number of links involved. For example, a call out of New York involving Chicago, Boston, and Washington would be computed at the rate of the New York-Chicago link times three.

"Meet me" and "dial out" (i.e., operator-assisted) bridges can also be purchased from manufacturers such as Telephonics, Pulscom, and Western Electric for installation on your premises. The purchaser assumes responsibility for debugging, troubleshooting, and maintenance.

Special assembly tariff bridges can be obtained from the phone company. This means that the client pays the purchase price for the bridge and a monthly maintenance fee. The bridge is housed on the phone company's premises. The purchaser has exclusive use of the bridge, but assumes responsibility for debugging, troubleshooting, and maintenance. This is the best arrangement for those without in-house telephonic expertise.

When scheduling the installation of special equipment, a good rule of thumb is to take the estimated installation time and triple it. Then give yourself some extra time on top of that. Keep this in mind when scheduling implementation.

TRAINING

Training is crucial for the successful implementation and operation of a telephone conferencing system. It enables users to troubleshoot technical problems themselves. They will learn to anticipate problems by knowing what to expect, what a good line sounds like, and the effects of bad lines on the overall audio quality of the conference. Good training will also help users determine what types of activities can best be done via telephone conferencing and what preparation is necessary for the various applications, the time it takes, and the demands it makes on organizations. Users must learn what procedures and formats work best for them and how to make realistic time, personnel, and budgetary allocations.

Ideally, training should be conducted prior to the purchase and installation of equipment. It is only after users become sophisticated about telephone conferencing that a realistic bridging design is possible. Commercial services are good training vehicles and readily available.

CONCLUSION

In conclusion, important lessons were drawn from the experience with DD organizations in Vermont. Problems in choosing components, estimating costs, installing the system, and training users were faced as they occurred in the field and solved in ways consistent with the personnel and resources at hand. That such problems can be overcome is apparent from the fact that the telephone conferencing demonstrations in Vermont are now becoming the basis for expansion into an integrated communications network to serve the future needs of DD people in the state. These problems, however, are far from trivial and still stand as serious obstacles for groups that want to realize the potential of telephone conferencing in the near future.

APPENDIX A

A SAMPLING OF END INSTRUMENTS

Eight kinds of end instruments were tested for the Vermont project*:

Companion I
Companion II
Orator
Panasonic Speakerphones
Bilsom Headsets with Built-in Microphone
Darome Mini-Convener
Speakerphone 4-A
Speakerphone 50-A

An assessment of each follows:

Companion I. Good pick-up quality on microphone. Very sensitive to room acoustics. Therefore, in an environment with clean walls (no pictures, bookcases, wall hangings, etc.), the sound quality is "echo-like." The speaker on the instrument sounds a bit "tinny" but satisfactory. The instrument has no "pause" features. That means there is no way to temporarily leave a meeting or shut out room noise.

Installation: Must be done by someone familiar with the internal working of a phone. The phone must be taken off, screws connected, and then the whole unit must be reassembled. Four wires are involved. In addition, a power source is needed. This means extra wires and makes moving the Companion I awkward and difficult.

Cost: $119.00

Supplier: North Supply Company
10951 Lakeview Avenue
Lenexa, KS 66219

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*Important Note: Because the field is changing so rapidly, the information in this Appendix is currently accurate but may quickly become outdated.

Companion II. Same audio features as Companion I but this model offers the "pause" feature.

Installation: Installation is more complex because of the "pause" feature. Multiple wires must be connected. Also, it must be powered by an outside source, making it awkward to move.

Cost: $144.80

Supplier: North Supply Company

Orator. The Orator is designed to function in a "receive" mode. That is, when turned on it amplifies the audio conference, but to talk one must lift the telephone receiver and break in. Although keeping the receiver down reduces extraneous noise in a conference, the ability to "break in" can be crucial.

Installation: The Orator requires an internal hook-up (four wires). Therefore, a technician must go to the user's home to install it.

Cost: $27.50

Supplier: North Supply Company

Panasonic Speakerphone. The audio quality of the Panasonic is not as high as the Companion. It has a noticeable "clipping" effect when more than two links are involved in a conference, and the clipping increases geometrically with the number of Panasonics involved in a conference. However, in a one-to-one link audio quality is adequate.

Installation: The Panasonic is relatively simple to install in most homes since it takes advantage of the new minimodular jack that is now the phone company standard nationally with two exceptions: the current Princess wall phone model and the older, nonmodular jack phone models. It, too, requires external power, but is engineered so that the connection is manageable and the units are relatively easy to move around.

Cost: $60.05

Supplier: Portnoy's Appliance
125 West 45th Street
New York, NY 10036

Bilsom Headsets with Built-in Microphone and Plantronic Jack Set. The Bilsom headsets are for people in environments too noisy for a speakerphone (i.e., a desk in an office shared by many people). There are two significant drawbacks to the Bilsom: the headsets tend to be too tight for comfort and are difficult to stretch out, and the low audio levels lead to fatigue and irritability. A less significant problem is microphone placement. Users tend to position microphones too far away from their mouths, resulting in low audio levels from those points on the conference.

Installation: Requires getting into the telephone and making semipermanent modifications as well as attaching a side jack to the telephone. Technicians must go to the site to install the equipment.

Cost: $187.50

Supplier: Unex
321 Newberry Street
Hawthorne, MA 01937

Darome Mini-Convener (Model 610A). The Darome Mini-Convener consists of a speaker and four "push to talk" microphones. This equipment is well suited to "tele-lectures" which involve lengthy one-way presentations with an occasional question. But for highly interactive uses, the "push to talk" feature becomes a significant barrier to acceptable audio quality because of "clipping." The switching mechanism is not quick to respond to audio cues. Participants may be halfway through a word before their voice is heard by others on the conference. In addition, a person speaking cannot hear others wishing to interrupt until he relinquishes the audio channel. A long-winded speaker could dominate for a long time, oblivious to others wanting to speak.

Cost: $630.00

Supplier: The Darome Connection
8 West Street, Suite 19
Danbury, CT 06810

Speakerphone 4-A. The 4-A was developed by Western Electric and is therefore highly compatible with the phone company's audio switching technology. "Clipping" is minimal. It offers a "pause" feature to reduce or block unwanted noise from "leaking" into an audio conference. Like the Companion I and II, audio quality is somewhat dependent on the acoustics of the room in which it is located. The pick-up on the microphone is excellent.

Installation: If the 4-A is rented from the phone company, it takes care of installation. It is somewhat portable but nevertheless tied with an umbilical cord to the phone. Since it derives its power from the phone, there are no additional wires. If the 4-A is purchased, it must be installed by someone familiar with the inside workings of a phone. It is wired from the inside. There are no known minimodular jack 4-As.

Cost: Rental - $12.50 (monthly)
Purchase - $550.00

Suppliers: New England Bell (rental)
North Supply Company (purchase)

Speakerphone 50-A. The 50-A is designed for use by a large group of people. It consists of a four-prong wall plug, a telephone, a built-in microphone, two external microphones, and a speaker. It comes in a portable unit and can be carried around in its carrying case. All that is needed to use it is a four-prong wall telephone line outlet. The audio quality of the 50-A is slightly below that of the 4-A, but for large groups it is the best available.

Installation: Requires that rooms used for meetings be equipped with a working telephone line and a four-prong outlet. Does not require a technician.

Cost: Rental - $15.25 (monthly)
Purchase - $695.71

Suppliers: New England Bell (rental)
Graybar Electric
21-15 Bridge Plaza North
Long Island City, NY 11101

APPENDIX B

TELECOMMUNICATIONS AND SERVICE TO THE DEVELOPMENTALLY DISABLED

PUBLICATIONS LIST

TELECOMMUNICATIONS AND SERVICE
TO THE DEVELOPMENTALLY DISABLED

VOLUME 1: NEEDS AND OPPORTUNITIES — April 20, 1979

Summarizes results from project needs assessment, the rationale for demonstrations, and an appraisal of telecommunications options.

VOLUME 2: APPLICATION POSSIBILITIES — May 15, 1979

Discusses ideas for DD telecommunication applications gathered during needs assessment. Glossary. Bibliography

VOLUME 3: DECISIONS ON DEMONSTRATION PROJECTS — July 2, 1979

Presents decision for implementation phase of project.

NATIONAL NETWORKING AMONG UAPS:
A PILOT TEST OF ELECTRONIC MAIL — November 1979

Summarizes results of pilot test of computer-based message system conducted by the American Association of University Affiliated Programs.

A MANUAL FOR UAF ONTYME MESSAGE SYSTEM USERS — November 1979

A specially prepared user's guide for UAP electronic message system users.

NATIONAL NETWORKING AMONG UAPS:
A TELECOMMUNICATIONS DEMONSTRATION — January 1980

Outlines plan for UAP national networking demonstration.

MAKING TELECOMMUNICATIONS WORK FOR THE DEVELOPMENTALLY DISABLED: A FIRST REPORT ON THE VERMONT DEMONSTRATIONS — January 1980

Reviews specific applications under way or planned for Vermont.

CHOOSING AN ELECTRONIC MESSAGE SYSTEM: A GUIDE FOR THE HUMAN SERVICES — September 1980

An introduction to strengths and weaknesses of electronic message systems.

ESTABLISHING A TELEPHONE CONFERENCING SYSTEM: THE DYNAMICS OF DOING IT — September 1980

Summarizes most important factors in establishing a telephone conferencing system.

NATIONAL NETWORKING AMONG UAPS: A TELECOMMUNICATIONS DEMONSTRATION — October 1980

Final report of the national networking demonstration.

Copies of the above papers may be obtained by writing:

Developmental Disabilities Project
Institute for the Future
2740 Sand Hill Road
Menlo Park, California 94025
415-854-6322

or

Alternate Media Center
School of the Arts
New York University
725 Broadway, 4th Floor
New York, New York 10003
212-598-2852